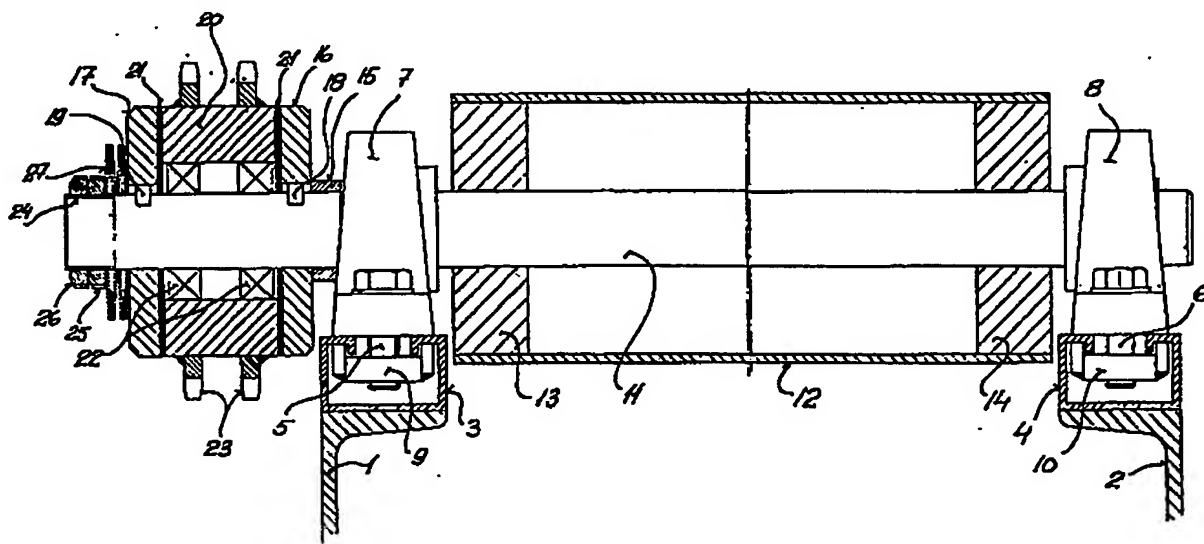


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(54) Title: AN APPARATUS FOR THE ACCUMULATIVE HANDLING OF GOODS ON A ROLLER CONVEYOR**(57) Abstract**

Such accumulative conveyors are used to a great extent in, int. al., foundries for transport and temporary storage of semi-finished goods, finished goods unpacked or in crates or cartons etc. One object of the present invention is to obviate or at least reduce the problems inherent in prior art rollers for the accumulative handling of goods. This is satisfied according to the present invention in that a number of rollers in the roller conveyor consist of a cylindrical roller disposed on a through shaft (11) or provided with stub shafts, that the shaft ends or stub shafts are journaled in suitable bearings (7, 8) and that at least the one shaft end or stub shaft extends through the bearing (7) and on the outside thereof displays a sliding clutch (16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27).

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TITLE

An apparatus for the accumulative handling of goods on a roller conveyor.

TECHNICAL FIELD

5 The present invention relates to an apparatus for the accumulative handling of goods on a roller conveyor. Such accumulative roller conveyors are used to a great extent in, inter alia, foundries for the transport and temporary storage of semi finished goods, finished products unpacked
10 or in crates or cartons etc.

THE STATE OF THE ART/TECHNICAL PROBLEM

Prior art apparatuses for the accumulative handling of goods on a roller conveyor comprise, in most cases, a number of rollers of the so-called accumulating type, that
15 is to say rollers which are driven but permit slipping when the goods on them are not moved for some reason but are stationary. Even if the rollers are continuously driven, it should be possible for the goods to remain stationary on them for both long and short periods of time and, and
20 as soon as a portion of the goods has left the conveyor thereby making room for further goods, the hitherto stationary goods are advanced immediately. As soon as the goods movement on the conveyor is once again prevented, the rollers on which the goods rest once again begin to



begin to slip and the conveyor thereby has an accumulative quality.

Hitherto known accumulating rollers normally consist of a tubular steel jacket on a shaft. Between one end of the jacket and the shaft there is disposed an end cup
5 journaled on the shaft and, between the opposite end of the jacket and the shaft there is disposed a sliding clutch with axial clutch surface and axial bearing coating. Driving of the roller and its jacket takes place via the
10 shaft, the driving force being transmitted from the shaft to the jacket by the intermediary of the axial bearing coating. Bearings are disposed outside the sliding clutch and the end cup and, outside the one bearing, the shaft is driven by the intermediary of one or more chain
15 sprockets.

The inconveniences inherent in the above-mentioned construction are legion. The slipping can not be regulated or adjusted after assembly and installation. The sliding clutch or bearing coating is constantly exposed to the
20 same weight loading as the roller itself, which to a great extent increases wear and thereby reduces the working life of the clutch. The location of the sliding clutch and the bearing coating also entails that repairs to the sliding clutch require dismantling of the entire roller, which
25 in turn leads to long down times and high costs. The problem involved in wear is of extremely great importance in an apparatus of this type, since the slipping periods can be relatively long and, during these slipping periods, the sliding clutch can, moreover, be exposed to maximum
30 loading.

One object of the present invention is to obviate, or at least reduce the problems inherent at least in the above-described apparatus for the accumulative handling of goods.

35 TECHNICAL SOLUTION

The above-disclosed object is satisfied according to the present invention in an apparatus of the type disclosed



by way of introduction, in that a number of rollers in the roller conveyor consist of a cylindrical roller disposed on a through shaft or provided with stub shafts, that the shaft ends or stub shafts are journaled in suitable bearings, and that at least one shaft end or stub shaft extends through the bearing and, on the outside thereof, displays a sliding clutch. The sliding clutch is preferably provided with two discs interconnected with the shaft, between which discs there is disposed a ring which is centered on the shaft by means of one or more ball bearings. A wear coating is preferably disposed between the ring and the discs. Spring means are provided to urge the discs and the ring towards each other. Preferably, the spring means include an adjustment member for adjusting the exercised spring force. The spring means comprise essentially cup springs and the adjustment member consists of a nut on a threaded portion of the shaft end with the sliding clutch, which consists of a spacer member most proximal the bearing for the shaft end, the first disc, the first wear coating, the ring, the other wear coating and the other ring, against which the cup springs are urged by means of the nut. The discs are connected to the shaft end by means of keys and keyways, while the ring is, on the outer side, provided with one or more chain sprockets.

DESCRIPTION OF THE ACCOMPANYING DRAWINGS

The present invention will now be described below in greater detail with reference to the accompanying drawing which is a side elevation, partly in section, of one embodiment of an apparatus according to the present invention.

PREFERRED EMBODIMENT

The embodiment of the present invention shown on the drawing consists of a so-called accumulative roller for a roller conveyor. The rollers in such a conveyor are preferably mounted on longitudinal U-beams 1 and 2, of which only parts are shown on the drawing. On the upper side of the beams 1 and 2, there are secured rails 3 and 4, whose



upper side display one or more slots for the passage of assembly screws or assembly bolts 5 and 6. The assembly bolts 5 and 6 serve for screwing in place of each respective end bearing 7 and 8 against the rails 3 and 4 with the assistance of slotted head nuts or counter rails 9 and 10 disposed in the rails.

A shaft 11 extends through the bearings 7 and 8, which suitably may consist of Y-steel bearing units. Between the bearings 7 and 8, the shaft 11 supports a jacket 12 which preferably consists of steel tubing which, at least at the ends, is centred on the shaft 11 by means of end pieces 13 and 14. These end pieces 13 and 14 may suitably be manufactured from round bar pieces.

On the outer side of the bearing 7, there is disposed on the shaft 11 a spacer member 15, and, on the outer side of the spacer member or spacer ring 15, there is disposed a sliding clutch.

The sliding clutch consists of an inner disc 16 and an outer disc 17. The discs 16 and 17 are interconnected with the shaft 11 each by means of their key 18 and 19. The keys 18 and 19 are disposed in keyways in the shaft 11, and the discs 16 and 17 are provided with keyways in order to be shiftable over the keys 18 and 19. Between the discs 16 and 17, there is disposed a ring 20 by the intermediary of a wear coating 21 on each side of the ring 20. The ring 20 is centred on the shaft 11 by means of bearings 22 which suitably may consist of deep-groove bearings. On the outside of the ring 20 there are disposed two chain sprockets 23. Naturally, driving of the ring 20 can also be effected in a manner other than using chain sprockets. The end of the shaft 11 provided with the sliding clutch displays a thread 24 and, in the present case, an adjustment nut 25 and an arrest nut 26, as well as a number of cup springs 27.

As a result of adjustment of the urging tension by the springs 27 of the sliding clutch parts against the spacer ring 15, it is obviously possible to regulate the slipping moment of the sliding clutch. The wear surface 21 preferably



consists of some suitably low-friction material such as, for example, nylon, and, in one prototype, use has been made of a material having the designation "delrin". In the same prototype, the roller jacket 12 had a length of approx. 1 m. and test runs have shown that the arrangement of the sliding clutch provides extraordinary advantages. First, the clutch is extremely easily accessible and easy to adjust and set by means of the nuts 25, 26 and the cup springs 27. Furthermore, it is extremely easy to carry out repairs on the sliding clutch and, for example, to replace the wear surfaces 21. As a result of the favourable orientation and location of the wear surfaces, it has, however, proved that these have extremely long working life. Without any visible deterioration of the state of the wear surfaces 21, it has been possible for these during long periods of time to withstand loadings of 2.5 kilopond metre. On this point, it should be observed that the jacket 12 of the prototype roller had a diameter of approximately 100 mm.

CLAIMS

1. An apparatus for the accumulative handling of goods on a roller conveyor, characterized in that a number of rollers in the roller conveyor consist of a
5 cylindrical roller disposed on a through shaft or provided with stub shafts, that the shaft ends or stub shafts are journaled in suitable bearings, and that at least the one shaft end or stub shaft extends through the bearing and, on the outer side, displays a sliding clutch.
- 10 2. Apparatus according to claim 1, characterized in that the sliding clutch has two discs interconnected with the shaft, between which discs there is disposed a ring which is centred on the shaft by means of one or more bearings, for example ball bearings.
- 15 3. Apparatus according to claim 2, characterized in that wear surfaces are disposed between the ring and the discs.
4. Apparatus according to claims 2 and 3, characterized in that spring means are provided for urging
20 the discs and the ring towards each other.
5. Apparatus according to claim 4, characterized in that said spring means include an adjustment member for regulating the exercised spring force.
6. Apparatus according to claim 4 and 5, characterized in that

claim 6 contd.

t e r i z e d in that said spring means essentially comprise cup springs, and that said adjustment member consists of a nut on a threaded portion of the shaft end with the sliding clutch, which consists of a spacer member most proximal to the bearing for the shaft end, the first disc, the first wear surface, the ring, the second wear surface and the second ring, against which the cup springs are urged by means of the nut.

7. Apparatus according to claims 3 to 6, c h a r a c -
10 t e r i z e d in that the discs are coupled on the shaft end by means of keys and keyways.

8. Apparatus according to claims 3 to 7, c h a r a c -
t e r i z e d in that the ring is, on the outer side,
provided with one or more chain sprockets.

15

INTERNATIONAL SEARCH REPORT

International Application No PCT/SE80/00302

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ¹ According to International Patent Classification (IPC) or to both National Classification and IPC ² <div style="text-align: center; padding: 10px 0;">B 65 G 13/07, 23/26 // F 16 D 7/02</div>																										
II. FIELDS SEARCHED <div style="text-align: center; padding: 5px 0;">Minimum Documentation Searched ⁴</div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%; padding: 5px;">Classification System</th> <th style="padding: 5px;">Classification Symbols</th> </tr> <tr> <td style="padding: 5px;">IPC ³</td> <td style="padding: 5px;">B 65 G 13/00-075, 23/00, 24, 26; F 16 D 7/00-02</td> </tr> <tr> <td style="padding: 5px;">National Cl</td> <td style="padding: 5px;">47c:8; 81e:9, 81</td> </tr> <tr> <td style="padding: 5px;">US Cl</td> <td style="padding: 5px;">64:30; 193:35, 37; 198:780, 781, 855, 856</td> </tr> </table> <div style="text-align: center; padding: 5px 0;">Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched ⁵</div> <div style="padding: 10px 0;">SE, NO, DK, FI classes as above</div>			Classification System	Classification Symbols	IPC ³	B 65 G 13/00-075, 23/00, 24, 26; F 16 D 7/00-02	National Cl	47c:8; 81e:9, 81	US Cl	64:30; 193:35, 37; 198:780, 781, 855, 856																
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁶ Special categories of cited documents: ¹⁶</p> <p>"A" document defining the general state of the art</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document cited for special reason other than those referred to in the other categories</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> </div> <div style="width: 45%;"> <p>"P" document published prior to the international filing date but on or after the priority date claimed</p> <p>"T" later document published on or after the international filing date or priority date and not in conflict with the application, but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance</p> </div> </div>																										
IV. CERTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> Date of the Actual Completion of the International Search ¹ <div style="text-align: center; padding: 5px 0;">1981-03-10</div> </td> <td style="width: 50%; padding: 5px;"> Date of Mailing of this International Search Report ¹ <div style="text-align: center; padding: 5px 0;">1981-03-11</div> </td> </tr> <tr> <td style="padding: 5px;"> International Searching Authority ¹ <div style="text-align: center; padding: 5px 0;">.....</div> </td> <td style="padding: 5px;"> Signature of Authorized Officer ¹⁹ <div style="text-align: center; padding: 5px 0;"> </div> </td> </tr> </table>			Date of the Actual Completion of the International Search ¹ <div style="text-align: center; padding: 5px 0;">1981-03-10</div>	Date of Mailing of this International Search Report ¹ <div style="text-align: center; padding: 5px 0;">1981-03-11</div>	International Searching Authority ¹ <div style="text-align: center; padding: 5px 0;">.....</div>	Signature of Authorized Officer ¹⁹ <div style="text-align: center; padding: 5px 0;"> </div>																				
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